# BJWSA's Climate Adaptation Study

**Charles Sexton, PE**

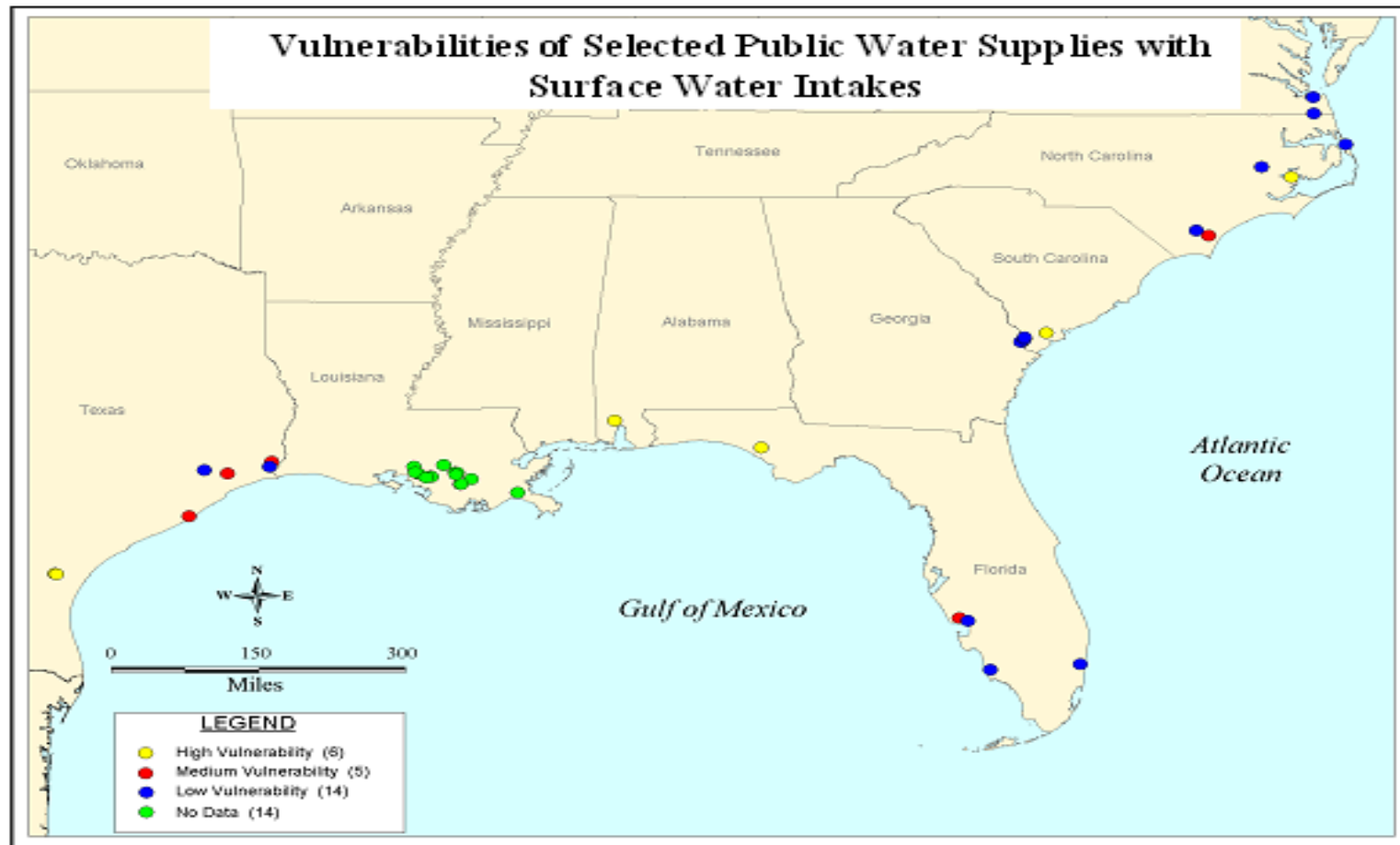**Beaufort-Jasper Water and Sewer Authority**

**Beaufort, South Carolina**

# BJWSA in Brief

- Public, non-taxing regional water and sewer utility
- 1300 sq mile service area – explosive growth
- Wide range of customer characteristics (rich – poor)
- 45,000 retail customers, 7 wholesale customers including 4 military bases
- 2010  Operations & Maintenance budget – $43,400,000
- 2009–2011  Capital Improvement Program - $79,000,000
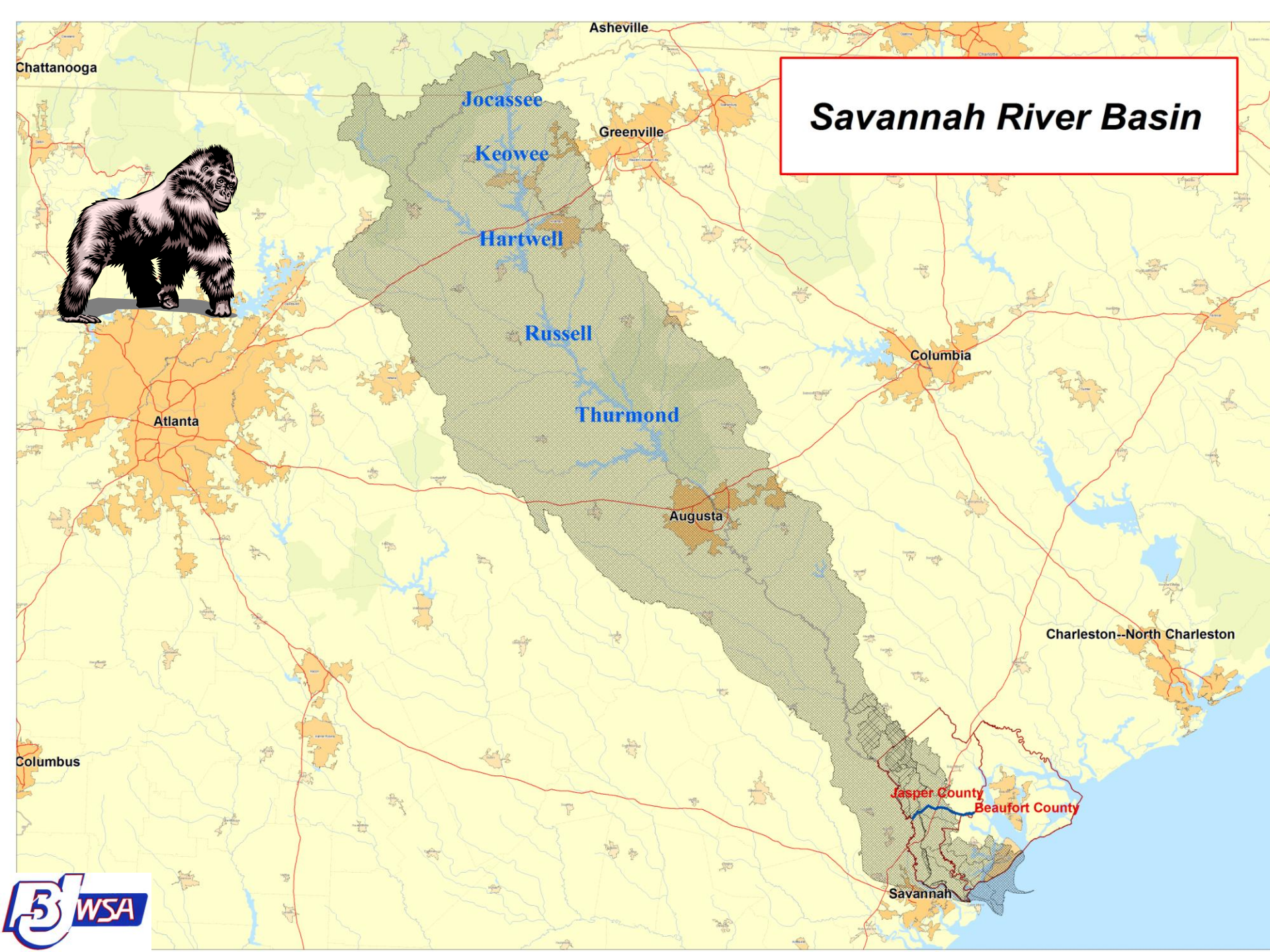
# Vulnerabilities of Public Water Supplies



Vulnerabilities of Selected Public Water Supplies with Surface Water Intakes

LEGEND
- High Vulnerability (6)
- Medium Vulnerability (5)
- Low Vulnerability (14)
- No Data (14)

# Salinity Intrusion Factors

- Stream flow

- Mean Tidal Water-levels

- Tidal Range



Riverine flow | Freshwater → ← Saltwater | Tidal forcing
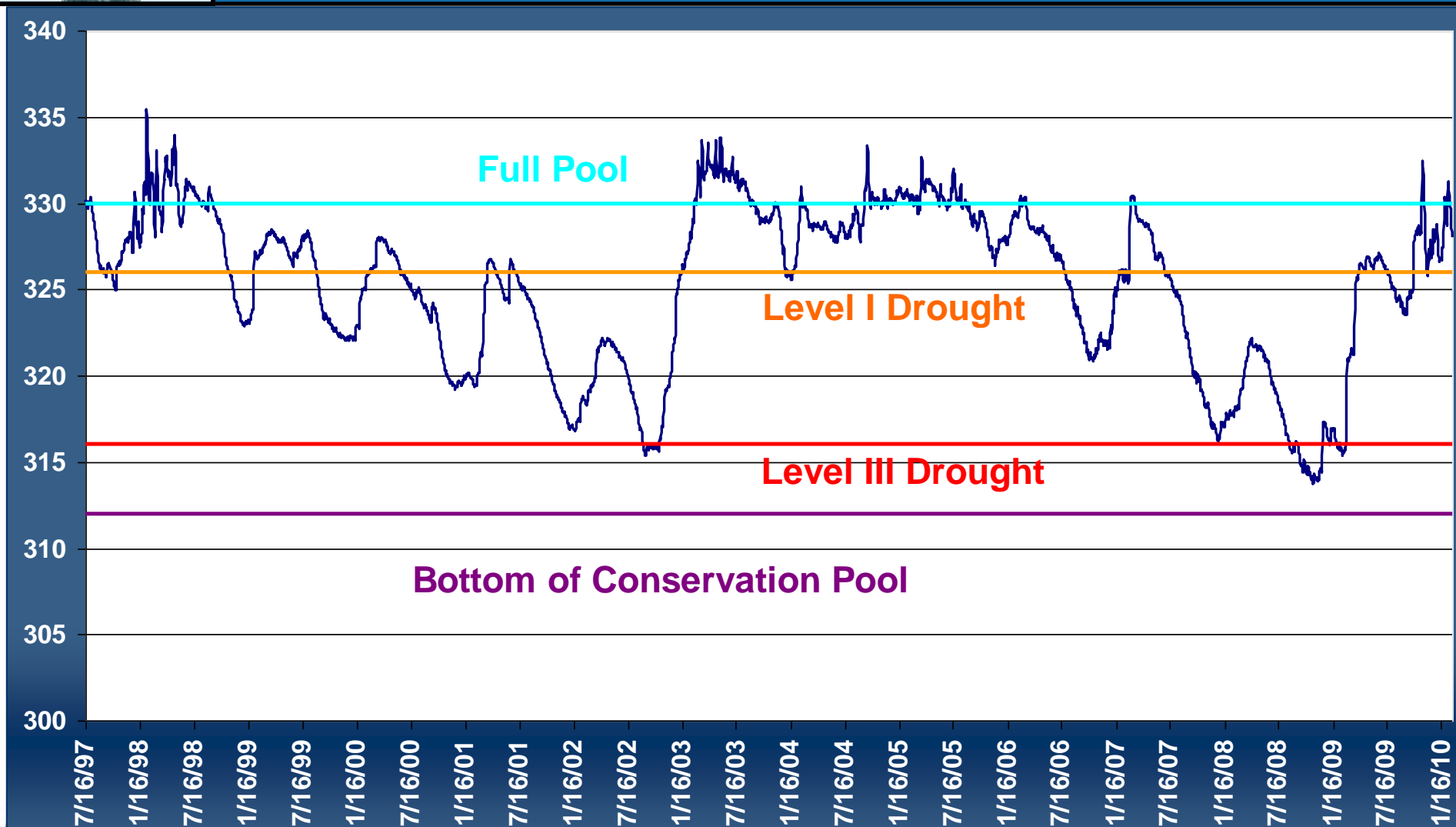1) Mean water level
2) Tidal range

Savannah River Basin

# Savannah River Supply

## Lake Thurmond Water Elevations
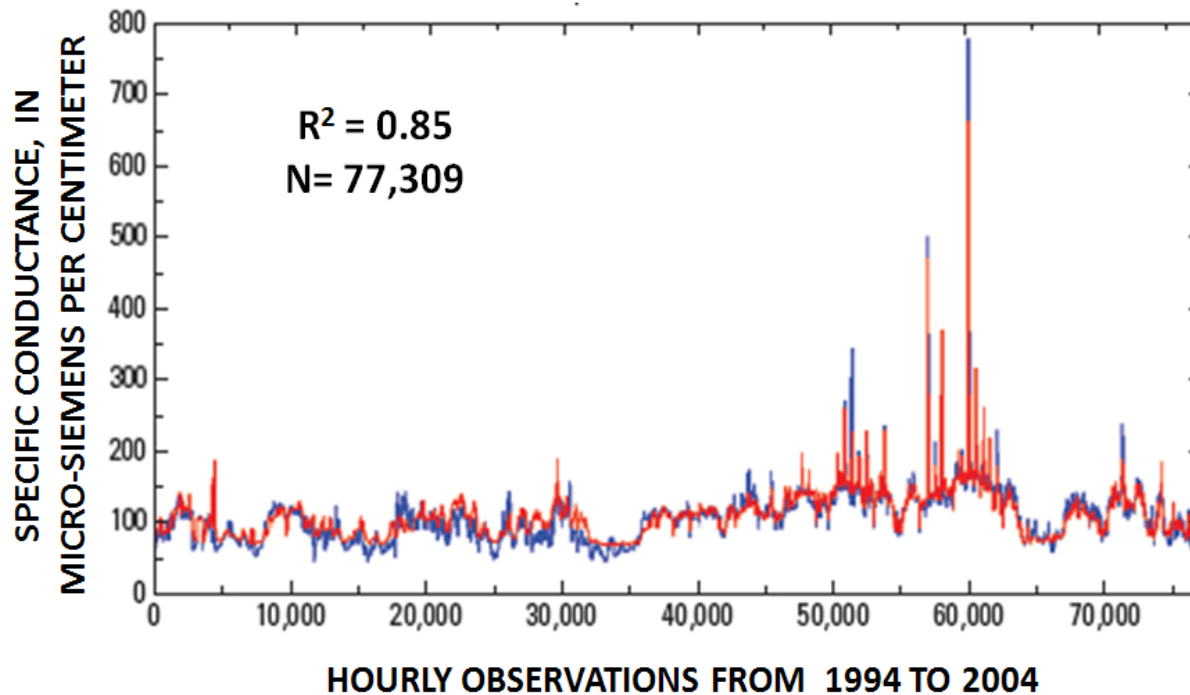
# Artificial Neural Networks



**Figure 7. Measured (blue trace) and predicted (red trace) daily specific conductance for the Savannah River at I-95 (station 02198840).**
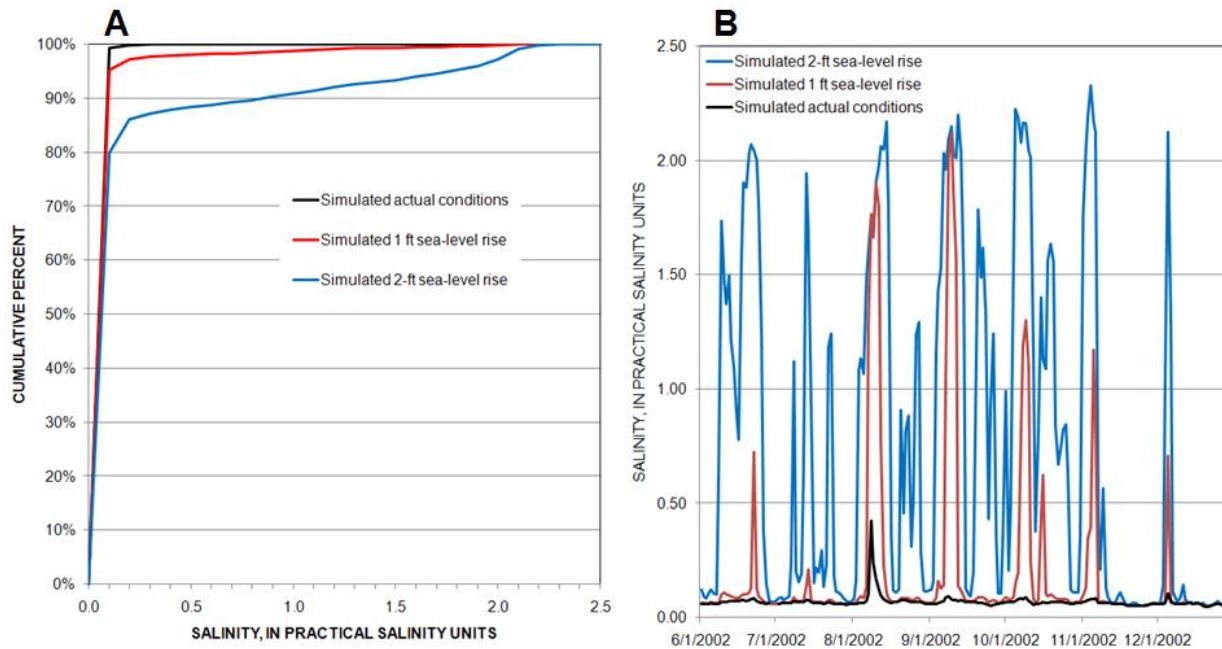
# Results with 1' and 2' Sea Level Rise



**Figure 8. Salinity response to a 1-ft and 2-ft sea-level rise. Plot on the left (A) shows the cumulative frequency distribution for a 7½ year simulation. Plot on the right (B) shows the time series for the daily response during 2002.**
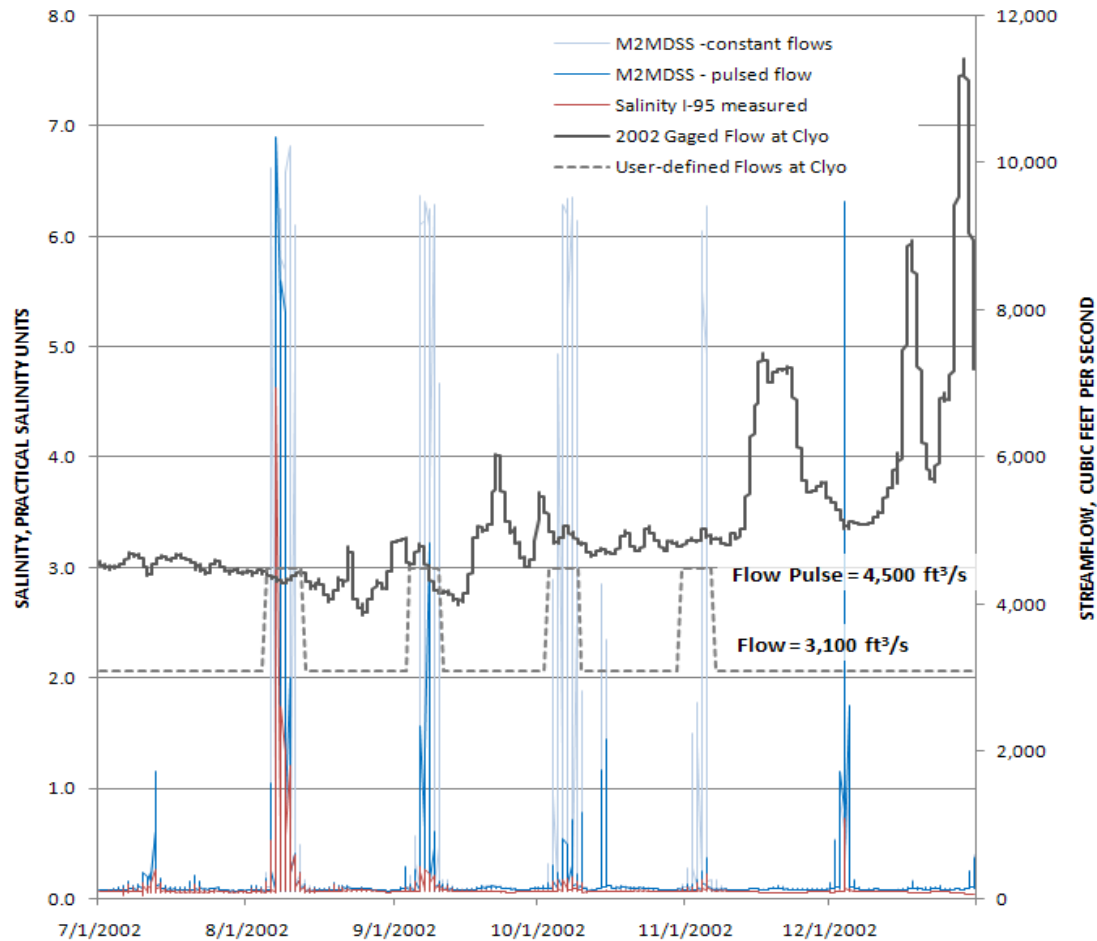
**Figure 11. Hourly salinity response at I-95 to user defined hydrograph with streamflow pulsed inserted to minimize salinity intrusion.**

# What's Next?

- Downscale Global Climate Models to predict stream flow and sea level rise

- Work is ongoing by University of South Carolina and NOAA

- Continue to work on new water supplies and protection of existing water supplies to meet the needs of Beaufort and Jasper Counties

# New Water Sources

Alternatives:

- Expand use of Savannah River and Aquifer Storage & Recovery

- Develop new well fields in Upper Floridan Aquifer (away from the coast)

- New ground water wells in Middle Floridan Aquifer  (treatment required)

- Collect and utilize storm water (irrigation)

- New surface water supplies from Salkahatchie or Edisto Rivers

- Desalinization of ocean/brackish water

# **Questions**